

sorghum and rice is ground first and a small quantity of similarly prepared paste of black gram is added. Salt, chillies and onions are added according to taste; butter milk may also be added. The paste is made into *dosai* by baking on a hot pan on which oil is smeared. Sorghum mixed with red gram and black gram *dhal* may be soaked in water, ground into thick coarse paste and made into another kind of pan cake known as *adaai* also.

Pops. Another common or easy preparation of sorghum is the pop (*pori* or *pelalu*). All sorghums do not pop well. The grain of the variety known as *Konda jonna* in the Northern districts and *Alangara cholam*, *Vensamarai cholam* or *Talaivirichan cholam* in the Central and Southern districts is the best for popping. The grain of this variety pops better than that of others. When small quantities (a handful at a time) of dry grain is put on a hot pan or pot and stirred, the grains 'pop'. The pops are taken off the pan or pot immediately. The pops can be made into balls mixed with jaggery and preserved for use. The pops as such or pounded can also be used mixed with milk and sugar, or butter milk, salt and chillies.

Other preparations which are not widely known but common in some places are *kudumulu* or *hidlee*—for which the sorghum flour is mixed with cowpea or Bengalgram and condiments, converted to paste, made into balls or thick flat cakes and cooked in steam; *chakkadam*—for which the flour is moistened with boiling water, salt added, made into small balls, cooked in steam, the cooked balls pressed in a hand press with perforated socket and the pressed stuff fried in oil; and *burelu*—for which the sorghum flour is mixed with jaggery, moistened with water, made into small balls and fried in oil. These show that sorghum can be substituted for rice to prepare many products for every day consumption.

A Trial with Cocanada Cottons

By K. SANKARAIAN,

Thumadu, Kondukur Taluk, Nellore District

Since there had been a good market for the short staple cotton of white and red mixture and there had been increasing demand for pure red cotton I had to replace the local variety by a suitable one. For this purpose I conducted a trial in 1941-42 with the following varieties: (i) local (Kandukur); (ii) Kanigiri (Nellore district) (iii) Ambapuram (Guntur district) and (iv) X-20—a 'Cocanada' strain of the Madras Agricultural Department. All these varieties are classed as 'Cocanadas' by the trade.

The trial was conducted in black soil of medium fertility. A rectangular block of the field was divided into seven plots and the different varieties were sown in these in the following arrangement: Plot 1—local, plot 2—X-20, plot 3—local, plot 4—Kanigiri, plot 5—local, plot 6—Ambapuram and plot 7—local. Each plot contained 8 rows of plants 165 ft. long and

5 ft. apart, of which the produce of 6 middle lines of each plot was harvested separately for comparing yields. One line of redgram was sown to demarcate the boundaries between plots.

Cotton is not grown in this tract as a pure crop. It is grown mixed with a millet, like *ragi* (*Eleusine coracana*) or *arika* (*Paspalum scrobiculatum*) and pulses. About one-sixteenth by measure of pluse seeds are mixed with the millet seed. Following the local practice cotton was sown as a mixed crop with *ragi*. The crop was sown on the 4th September 1941. Ten days after sowing, gaps were filled by sowing fresh seed and crowded plants were thinned out to a spacing of 4 in. between plants.

The harvest of cotton was commenced on the 11th March 1942. Each plot was marked out by four pegs at the corners and a rope tied all round excluding the two outer rows and 5 ft. of every row at either end. The weight of kapas from each plot was weighed soon after harvest. The record of yields of the different plots are presented in the following table :—

| Date of harvest | Weight of Kapas in lb. | | | | | | |
|-----------------|------------------------|----------------|-----------------|--------------------|-----------------|---------------------|-----------------|
| | Plot 1 Local | Plot 2 X-20 | Plot 3 Local | Plot 4 Kanigiri | Plot 5 Local | Plot 6 Ambapuram | Plot 7 Local |
| 11-3-1942 | 19 | 31 | 16 | 13 | 10 | 14 | 20 |
| 22-3-1942 | 5 | 6 | 16 | 8 | 5 | 4 | 5 |
| 3-4-1942 | 2 | 1 | 4 | 4 | 6 | 4 | 4 |
| 23-4-1942 | 1.5 | 2 | 2.5 | 1.5 | 2.5 | 1.5 | 1 |
| Total | 27.5 | 40 | 38.5 | 26.5 | 22.5 | 23.5 | 30 |

The area of each plot is $\frac{1}{16}$ acre. When the yields of the three new varieties were compared with those of the 'local' on either side, it was observed that X-20 yielded 21 percent more and Kanigiri and Ambapuram yielded 13 and 11 percent respectively less than the local. Hence X-20 was the best. Another factor in favour of X-20 was the proportion of lint to kapas. The ginning percentage of X-20 was 30 whereas the other varieties gave only 25 percent of lint.

When the money value was considered it was noted that the offer for the 'local' was Rs. 20 per candy of 500 lb. of kapas and for the X-20 kapas Rs. 25 per candy. On lint basis, the offers were Rs. 80 and 100 per candy for 'local' and X-20 respectively. The cost of seed was not taken into account as the seed is given towards ginning wages which is the local practice.

The merchants fix the price of kapas based on the assumption that the ratio of lint to kapas is 1:4. Since the proportion of lint in X-20 is greater than in the local cotton, selling as lint is more profitable. So I got the kapas ginned and sold the lint; and the seed which was given as wages or ginning was purchased for cash for feeding cattle.

While the local cotton spins to 12 to 15 counts, X-20 spins to 20 counts, as certified by the Manager, All India Spinners Association, Andhra branch, Kandukur. After a test he opined that X-20 was very satisfactory and was in no way inferior to Kanigiri red cotton which he had been mainly purchasing for his business, and that its cultivation may be extended and would find a ready market with him.

It is obvious from the particulars furnished above that X-20 cotton, a strain evolved by the Madras Agricultural Department is a better yielder, fetching an enhanced price of Rs. 10-13-0 per acre more than the local variety in Kandukur taluk (Nellore district). The harvest of X-20 can be completed earlier than the local by about a fortnight, as it is early flowering and maturing. Saving of watchman's wages for a fortnight is an additional profit. Since X-20 is a red cotton, unlike the local variety which is a mixture of white and red, it has a better market.

Under these circumstances I may say that the public funds utilised for cotton research has been spent fruitfully to the advantage of the cultivator and it is left to my co-cultivators to make the best use of the fruits of research.

SELECTED ARTICLE

Cultivation as an aid to Soil Fertility

By E. BATCHELOR, *Sherborne, Dorset*

Geological and astronomical authorities place the age of our world at somewhere between two and three thousand million years, and that of the consolidation of its crust at about two thousand million years. Since then the agents of disintegration and denudation—water, atmosphere, heat, cold, and frost and for some hundreds of millions of years, the roots of vegetation, together with rabbits, moles and earthworms—have, mainly through the solvent action of rain water, transformed the solid rock into sand and clay and transported these products, together with minerals in solution, into the rivers, seas and oceans. The geological formations resulting therefrom after being raised above sea level, have repeatedly been subjected to the same processes of disintegration and denudation.

Observation in a railway cutting or quarry will frequently show slightly disintegrated rock at a depth of only a few feet below the surface. Above this the rock can be seen to be in progressive stages of disintegration until, at the surface, the solid formation has been transformed into fine sand or clay and is ready for erosion by rain and surface flow into adjoining streams. What is now soil on the land surface was but a short time ago, as measured by the geological clock, solid rock some feet below the surface. The rates of disintegration and denudation are clearly interdependent and vary with climatic conditions.

The use of tillage implements accelerates the rate of disintegration and denudation.

Soil fertility enhanced by tillage. The mineral constituents of a plant are taken up in solution in water, but their solubility varies greatly; for example, that of silica is very much less than that of calcium. In this country disintegration is effected mainly by solution in the surface flow of water and by solution in the rain water sinking into the soil to the ground-water. The solvent power